GRID-IN QUESTIONS

Questions 58-62

58.

What is the value of the expression below?

$$6\sqrt{144} - 8\sqrt{81}$$

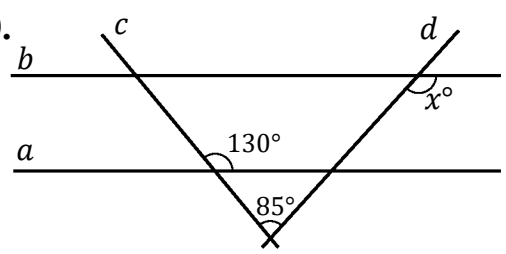
59.

Which value of x makes the equation

$$\frac{(3^7)^2}{3^{12}} \cdot 27 = 9^x$$

True?

60.



Two parallel lines a and b are cut by two lines c and d as shown in the diagram above. What is the value of x?

61.

Judy had 40 dimes and gave away x dimes. Gerald had 55 dimes and gave away twice as many dimes as Judy did. How many dimes did Gerald give away if they had the same number of dimes of left?

62.

Rudolf has 15 toy cars, 25 toy soldiers and 20 toy animals in his toy box. What is the probability that a randomly selected toy will not be a car?

MULTIPLE CHOICE QUESTIONS

Questions 63-66

63.

The first year, the population of mice on the Earth was estimated to be 3.2×10^8 The next year, the population of mice on the Earth decreased 4 times. Which expression represents the scientific notation of the mice population the next year?

A. 8.0×10^7

B. 0.8×10^8

C. 8.0×10^9

D. 0.8×10^9

64.

Write fraction $\frac{126}{48}$ as a decimal?

E. 2.75

F. 2.875

G. 2.625

H. 3.25

65.

Among 180 girls, 120 like apple juice and the rest like orange juice. Among 320 boys, 180 like apple juice and the rest like orange juice. Which statement is true?

A. The percent of girls that like orange juice is greater than the percent of boys that like orange juice

B. The percent of girls that like orange juice is less than the percent of boys that like apple juice

C. The percent of girls that like apple juice is less than the percent of boys that like apple juice

D. The percent of girls that like apple juice is greater than the percent of boys that like orange juice

66.

Which of the following sets consists of factors of 120?

E. $\{2, 6, 18, 24, 40, 60\}$

F. $\{4, 5, 8, 16, 20, 30\}$

G. $\{1, 3, 9, 12, 15, 20\}$

H. $\{1, 2, 3, 6, 12, 15, 40\}$

MULTIPLE CHOICE QUESTIONS

Questions 67-70

67.

Which list shows the numbers

$$\frac{39}{6}, 6.1\bar{4}, \sqrt{40}, \frac{32}{5}$$

in order from the smallest to the greatest?

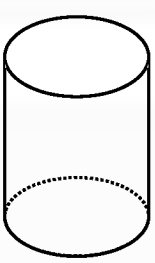
A. $\frac{39}{6}, \frac{32}{5}, \sqrt{40}, 6.1\bar{4}$

B. $6.1\bar{4}, \sqrt{40}, \frac{32}{5}, \frac{39}{6}$

C. $6.1\bar{4}, \frac{32}{5}, \frac{39}{6}, \sqrt{40}$

D. $\sqrt{40}, \frac{32}{5}, 6.1\bar{4}, \frac{39}{6}$

68.



The diameter of the cylindrical can is 10 cm. If the volume of the can is $350\pi\ cm^3$, what is the height of the can?

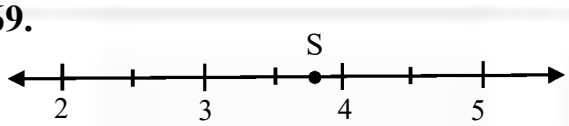
E. $3.5\ cm$

F. $14\ cm$

G. $1.4\ cm$

H. $35\ cm$

69.



Point S is shown on the number line above. Which number is closest to the point S position?

A. $\sqrt{4.5}$

B. $\sqrt{34.5}$

C. $\sqrt{24.5}$

D. $\sqrt{14.5}$

70.

What is the solution of the equation

$$\frac{2x}{3} - 5 = \frac{3}{4} - \frac{x}{6}?$$

E. 6.9

F. -8.5

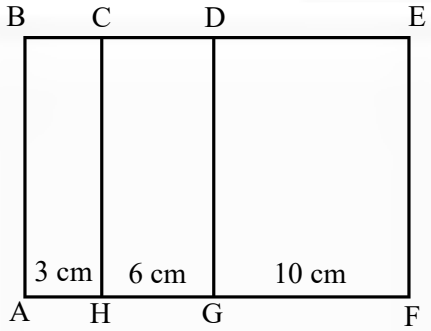
G. -6.9

H. 8.5

MULTIPLE CHOICE QUESTIONS

Questions 71-74

71.



If the area of the rectangle DEFG is 90 cm^2, what is the area of the rectangle ABEF?

A. 171 cm^2

B. 144 cm^2

C. 117 cm^2

D. 81 cm^2

73.

Sharon built square of Lego. This square consists of the same number of rows and columns. All the rows and columns had the same number of blocks in them. Which could be the total number of blocks Sharon used?

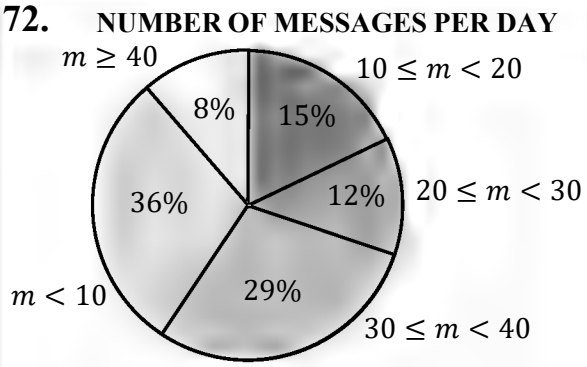
A. 341

B. 351

C. 361

D. 371

72.



The pie chart above shows the percentage of 1,800 students that send m messages each day. How many students send less than 30 messages per day?

E. 648

F. 918

G. 1,096

H. 1,134

74.

Which number is irrational?

E. $\sqrt{289}$

F. 17.12131415 ...

G. $17.\overline{12345}$

H. $-\frac{103}{6}$

MULTIPLE CHOICE QUESTIONS

Questions 75-78

75.

If $2M = 1 - 6N$ and $5N = 3 + 7P$,what is the expression of P in terms of M?

A. $-\frac{2}{7} - \frac{2M}{7}$

B. $\frac{-13-10M}{42}$

C. $\frac{-13+10M}{42}$

D. $-\frac{2}{7} + \frac{2}{7}M$

76.

Rosie is three times older than Grace and 3 years older than Sue. After 2 years Rosie's age will be the sum of Grace's and Sue's ages. How old is Rosie now?

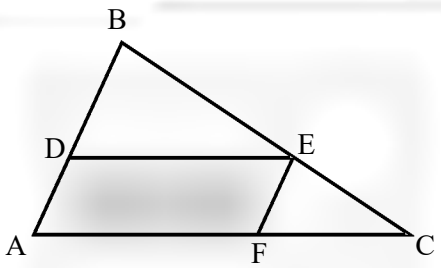
E. 1

F. 2

G. 3

H. 4

77.



In triangle ABC, the perimeter of the triangle BDE is 19 cm and the perimeter of the triangle EFC is 12 cm. If a quadrilateral ADEF is a parallelogram, what is the perimeter of the triangle ABC?

A. 15.5 cm

B. 30 cm

C. 31 cm

D. 33 cm

78.

For which equation is $x = -\sqrt[3]{12}$ the solution?

E. $x + 12^3 = 0$

F. $x^3 + 12 = 0$

G. $x^2 + 12^3 = 0$

H. $\sqrt[3]{x} + 12 = 0$

MULTIPLE CHOICE QUESTIONS

Questions 79-82

79.
In a special $30° - 60° - 90°$ right triangle ABC with right angle C, the leg BC = 12 cm is opposite to the angle 30°. Which statement is not true?

A. $AB = 24$ cm

B. $\angle B = 60°$

C. $P_{ABC} = 49$ cm

D. $A_{ABC} = 72\sqrt{3}\ cm^2$

80.
The angles of a triangle are in the ratio $2 : 3 : 7$. What is the measure of the greatest angle of this triangle?

E. 30°

F. 45°

G. 70°

H. 105°

81.
Which equation is not a linear equation?

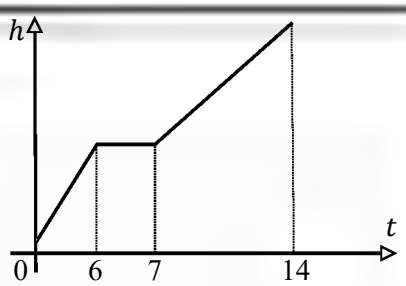
A. $3x - 1 = 4 - 5y$

B. $1 - 8x - 16y = 12$

C. $12 + 3x - 4y = 0$

D. $y = 2xy - 5$

82.



The graph above shows the dependence between Paul's age (in years) and his height. Which statement is false?

E. The rate of Paul's growth first 7 years is greater than the rate of his growth next 7 years

F. The rate of Paul's growth first 6 years is greater than the rate of his growth last 6 years

G. The rate of Paul's growth last 5 years is smaller than the rate of his growth first 5 years

H. Paul was of constant height during one year

MULTIPLE CHOICE QUESTIONS

Questions 83-86

83.
A jar is filled with quarters and dimes in the ratio of 4 to 3 (quarters to dimes). What is the probability that a randomly selected coin will be a dime?

A. $\frac{3}{7}$

B. $\frac{4}{7}$

C. $\frac{3}{4}$

D. $\frac{1}{3}$

84.
At a restaurant the cost for a breakfast pancake and coffee is $3.40. The cost for 3 pancakes and 2 coffees is $8.60. Which expression can be used to determine the cost of x pancakes and y coffees?

E. $2x + 1.4y$

F. $1.8x + 1.6y$

G. $1.6x + 1.8y$

H. $1.4x + 2y$

85.
The Think Global School has increased its number of students from 450 to 630 from last year. How big is the increase in percent?

A. 35%

B. 40%

C. 45%

D. 140%

86.
The objects on the scale make it balance exactly. On the left pan there is a 2-kilogram mass and half of a melon. On the right pan there is a whole melon. What is the weight of the whole melon?

E. 2

F. 4

G. 3

H. 6

MULTIPLE CHOICE QUESTIONS

Questions 87-90

87.

Jemma can make 8 paper planes in the same time that Ronald can make 12 planes. If Ronald had made 48 planes, how many planes had Jemma made?

A. 60

B. 52

C. 40

D. 32

88.

At the start of the week a shop had pens and pencils in the ratio $3:4$. By the end of the week, 30% of pens and 25% of pencils were sold and altogether 918 pens and pencils left. How many pens were sold by the end of the week?

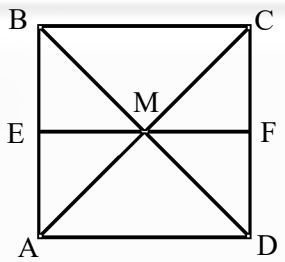
E. 540

F. 162

G. 378

H. 180

89.



In the square ABCD, which of the following statements is false?

A. $\triangle BEM \cong \triangle DFM$

B. $\triangle ABD \cong \triangle DCB$

C. $\triangle AMD \cong \triangle CMD$

D. $\triangle CAB \cong \triangle DAM$

90.

Jack has scored 82, 86 and 81 points passing three exams. Naomi has scored 78, 92 and x points passing the same three exams. What is the value of x, if Jack's average score is 1 point less than Naomi's average score?

E. 85

F. 78

G. 82

H. 88

MULTIPLE CHOICE QUESTIONS

Questions 91-94

91.

How many 4-digit odd numbers can be created using the digits 2, 3, 5, 7, and 0 without repeating any digits within that 4-digit number?

A. 48

B. 24

C. 36

D. 120

92.

If $M \cdot N < 0$ and $N \cdot (-P) > 0$, which of the following statements is true?

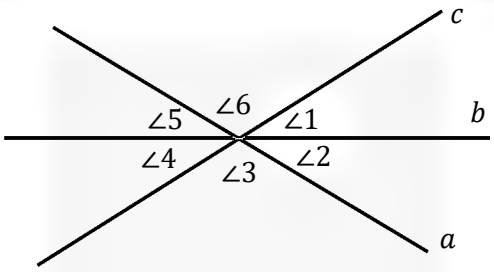
E. $\frac{M}{P} > 0$

F. $\frac{P}{M} < 0$

G. $-\frac{M}{P} > 0$

H. $\frac{-P}{-M} < 0$

93.



Three lines a, b and c intersect in one point. Which statement must be true?

A. $\angle 1 + \angle 4 + \angle 6 = 180°$

B. $\angle 2 + \angle 4 + \angle 5 = 180°$

C. $\angle 3 + \angle 5 + \angle 6 = 180°$

D. $\angle 4 + \angle 6 + \angle 2 = 180°$

94.

Megan makes handmade greeting cards. For each card her expenses are \$0.96 and advertisement expenses cost her \$25. If Megan has made x postcards, which expression correctly models her total expenses?

E. $\$(25 \cdot 0.96)x$

F. $\$(25 - 0.96x)$

G. $\$25 \cdot (0.96 + x)$

H. $\$(25 + 0.96x)$

MULTIPLE CHOICE QUESTIONS

Questions 95-98

95.

VACATION CHOICES

Kind of vacations	Number of people choosing
Active time spending	51
Sunbathing at the sea	48
Visiting unusual places	35
Staying at home	31

The table above shows the main preferences in spending vacations. Based on the information from the table, what is the probability that a randomly selected human will like visiting unusual places?

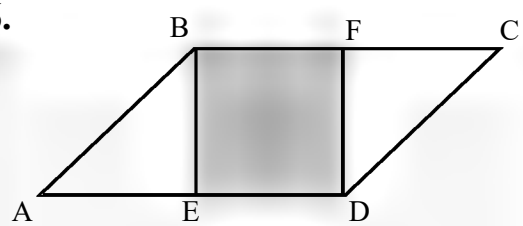
A. $\frac{7}{33}$

B. $\frac{17}{55}$

C. $\frac{16}{33}$

D. $\frac{9}{55}$

96.



In parallelogram ABCD, points E and F are midpoints of the sides AD and BC. If the shaded region is square of the area 36 un^2., what is the area of the parallelogram ABCD?

E. 48 un^2.

F. 60 un^2

G. 72 un^2.

H. 84 un^2.

97.

The school cafeteria serves pancakes every fourth day, hamburgers every sixth day and pizzas every ninth day. If cupcakes, hamburgers and pizzas are on today's menu, how many days will it be before they are all on the menu again?

A. 18

B. 36

C. 12

D. 72

98.

How many positive even integers satisfy the double inequality $-3 < 7 - 2x \leq 1$?

E. 2

F. 1

G. 4

H. 3

MULTIPLE CHOICE QUESTIONS

Questions 99-102

99.

Simplify the expression

$$6a(b+c)-3b(2a-c)$$

A. $3b(2a+c)$

B. $3b(a+2c)$

C. $3c(a+2b)$

D. $3c(2a+b)$

100.

If $x=\frac{1}{10}$, what is the value of the expression $x^2+4x+\frac{1}{x}+\frac{5}{x^3}$?

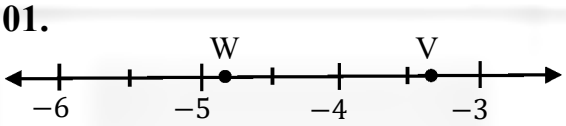
E. 105.104

F. 5010.14

G. 104.105

H. 5010.41

101.



On the number line above the position of the point W is $-4\frac{5}{6}$. If VW = $1\frac{1}{2}$, what is the position of point V?

A. $-3\frac{1}{3}$

B. $-3\frac{1}{6}$

C. $-3\frac{1}{2}$

D. $-3\frac{2}{3}$

102.

A rectangular prism has the length of the base of 15 cm. The width of the base and the height of the prism are equal. If the volume of the prism is $540\ cm^3$, what is the height of the prism?

E. 6 cm

F. 9 cm

G. 12 cm

H. 36 cm

MULTIPLE CHOICE QUESTIONS

Questions 103-106

103.
On a bike trip, Lennox was driving at a constant rate 50 mph. First, he drove 2 miles and then had a rest for 5 minute. Next he drove next 3 miles and then had a rest for 10 minutes. At last he drove last 5 miles. How long was Lennox on the trip?

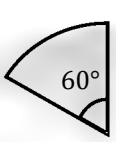
A. 21 minutes

B. 24 minutes

C. 27 minutes

D. 30 minutes

104.



The area of the given sector is $24\pi\ un^2$. What is the circumference of the circle with the same radius as in the given sector?

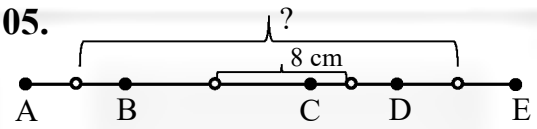
E. $12\pi\ un.$

F. $18\pi\ un.$

G. $24\pi\ un.$

H. $30\pi\ un.$

105.



Points B, C and D divides the segment AE into four non-congruent parts. The length of the segment AE is 30 cm. If the distance between midpoints of two middle segments is 8 cm, what is the distance between two midpoints of two utmost segments?

A. 21 cm

B. 23 cm

C. 25 cm

D. 27 cm

106.
Bethany is drawing a map with the scale factor of 12 km to 3 mm. If the distance between university and library is 16 km, what is the distance between corresponding points on her map?

E. 2 mm

F. 4 mm

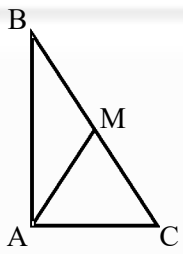
G. 6 mm

H. 8 mm

MULTIPLE CHOICE QUESTIONS

Questions 107-110

107.



In right triangle ABC, $\angle A = 90°$, point M is the midpoint of the hypotenuse BC and AM = 4 cm. If triangle AMC is equilateral triangle, what is the area of the triangle ABC?

A. $8\sqrt{3}\ cm^2$

B. $10\sqrt{3}\ cm^2$

C. $12\sqrt{3}\ cm^2$

D. $16\sqrt{3}\ cm^2$

108.

There are 4 books: Algebra, Geometry, English and Physics. In how many different ways can you arrange these 4 books on the shelf, if Algebra and Geometry must stand next to each other?

E. 12

F. 6

G. 18

H. 24

109.

A brand suit is at least 40% more expensive than a usual suit. Which of the following inequalities gives the relationship between the cost b of the brand suit and the cost u of the usual suit?

A. $b \geq 0.4u$

B. $b \geq 1.4\ u$

C. $b \geq u + 0.4$

D. $b \geq u + 1.4$

110.

Alex works as a shop assistant selling PS games. The store sells PS games for \$12.75 each without tax. On Monday, Alex has sold n PS games for \$185.64 including 12% tax. How many PS games has Alex sold on Monday?

E. $n = 10$

F. $n = 11$

G. $n = 12$

H. $n = 13$

MULTIPLE CHOICE QUESTIONS

Questions 111-114

111.
Collin wants to draw a rectangle with a perimeter of 160 cm and the largest possible area. Which dimensions of the rectangle will suit his wishes the best?

A. $10\ cm \times 70\ cm$

B. $20\ cm \times 60\ cm$

C. $30\ cm \times 50\ cm$

D. $40\ cm \times 40\ cm$

112.
If $7x - 4y + 9 = 0$, then $6y =$?

E. $21x + 27$

F. $14x + 18$

G. $10.5x + 13.5$

H. $17.5x + 22.5$

113.
Three partners, Tyler, Oliver and Scott, share the profits of a business in the ratio $5 : 2 : 8$, respectively.
Their profit for this year is \$343,440.
Determine the share of the profit for Oliver.

A. \$114,480

B. \$183,168

C. \$91,584

D. \$45,792

114.
What is the greatest possible value of $\sqrt{124 - |x|}$, if $-8 \leq x \leq 7$?

E. $2\sqrt{29}$

F. $3\sqrt{13}$

G. $2\sqrt{30}$

H. $2\sqrt{31}$